

Application No.: 10/603,924

Docket No.: JCLA7109-R

In The Claims:

Please amend the claims as follows:

Claim 1 (currently amended) A method of removing contaminants from a silicon wafer after a chemical-mechanical polishing operation, comprising:

providing a silicon wafer having a layer thereon;

performing a chemical-mechanical polishing process to remove a portion of the wafer;

and

treating the silicon wafer using an aqueous solution of ozone and providing an inertial mechanical force after the chemical-mechanical polishing process is performed, wherein the aqueous solution of ozone is catalyzed beforehand and the inertial mechanical force is provided by a polishing pad.

Claim 2. (original) The method of claim 1, wherein a concentration of ozone in the aqueous solution is between 10 ppm and 200 ppm.

Claim 3. (cancelled)

Claim 4 (original) The method of claim 1, wherein the step of treating the silicon wafer is performed by a water- cleaning process.

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Claim 5 (original) The method of claim 1, wherein the layer is selected from the group consisting of a low dielectric constant material layer, a metallic layer and a barrier layer.

Claim 6 (original) The method of claim 1, wherein the aqueous ozone solution is catalyzed to produce more free ozone radicals therein.

Claim 7 (original) The method of claim 6, wherein the aqueous ozone solution is catalyzed by exposure to a beam of ultraviolet light or addition of hydrogen peroxide thereto.

Claims 8-30 (cancelled)

Claim 31 (currently amended) A method of forming a damascene structure, comprising:
providing a substrate;
forming a dielectric layer over the substrate;
patterning the dielectric layer to form an opening that exposes a portion of the substrate;
forming a metallic layer over the substrate so that the opening is completely filled;
performing chemical-mechanical polishing to remove a portion of the metallic layer; and
treating the substrate using an aqueous solution of ozone and providing an inertial mechanical force so that contaminants on a surface of the substrate are removed, wherein the aqueous solution of ozone is catalyzed beforehand and the inertial mechanical force is provided by a polishing pad.

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Claim 32 (previously presented) The method of claim 31, wherein a concentration of ozone in the aqueous solution is between about 10 ppm and 200 ppm.

Claim 33 (previously presented) The method of claim 31, wherein the inertial mechanical force is proved by the polishing pad in a buffer CMP station.

Claim 34 (previously presented) The method of claim 31, wherein the inertial mechanical force is proved by the polishing pad in a cleaning station.

Claim 35 (previously presented) The method of claim 31, wherein the inertial mechanical force is between about 0.5 psi and 3 psi.

Claim 36 (previously presented) The method of claim 31, further includes:
forming a barrier layer over the substrate, wherein the barrier layer is conformal to the surface profile of the substrate and covers the dielectric layer before forming a metallic layer process but after patterning the dielectric layer process; and
performing barrier layer chemical-mechanical polishing to remove a portion of the barrier layer and expose the dielectric layer after performing chemical-mechanical polishing process.

Claim 37 (previously presented) The method of claim 31, wherein the inertial mechanical force is proved by the polishing pad in a metal CMP station.

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Claim 38 (previously presented) The method of claim 1, wherein the inertial mechanical force is proved by the polishing pad in a buffer CMP station.

Claim 39 (previously presented) The method of claim 1, wherein the inertial mechanical force is proved by the polishing pad in a cleaning station.

Claim 40 (previously presented) The method of claim 1, wherein the inertial mechanical force is proved by the polishing pad in a metal CMP station.

Claim 41 (previously presented) The method of claim 1, wherein the inertial mechanical force is between about 0.5 psi and 3 psi.